

of some porcelain telegraph insulators, and battery pots of porous clay. Comparison with the famous show at Paris is naturally provoked by the public statements which have been made, to the effect that the Sydenham exhibition will be equal, if not superior to that in the Champs Elysées, but there is really no comparison between the two displays. It is not merely in the number and variety of the exhibits that the difference is so marked; but in the arrangement of the whole, and the intrinsic value, ingenuity, and workmanship of the articles exposed. The Paris exhibition was a compendium of all that electricity had achieved since it became a science, and the visitor could there see within the compass of a single building the rough experimental apparatus with which all the great discoveries in electricity had been made, and the most powerful and magnificent effects which modern invention has elicited from them. Everything had been done by the exercise of French taste to make the exhibition as interesting and attractive as possible. A lighthouse, a model theatre, a picture-gallery, had been erected to show the capabilities of the electric light; the powers of the telephone were exemplified by means of a "salle d'audition," where visitors could hear the music of the Grand Opera and the elocution of the Comédie Française; an electric boat plied on the waters of an ornamental basin; an electric balloon was propelled through the air; and a great diversity of machines were put in motion by the electric current from sewing-machines and fans, up to hammers, pumps, and printing-presses.

There is no good reason why the English exhibition should not have been equally interesting and instructive if it had been carried out under happier auspices. To begin with, the time was ill-chosen, following, as it did, hard on the back of the Paris one, when foreign exhibitors had grown tired of exhibitions, and were eager to return to their homes. A year hence would have been a better time; and the response of foreign electricians would doubtless have been heartier. Moreover, the Crystal Palace is not well adapted for such a purpose. It is too far out of London, and being above all a place of entertainment, is out of keeping with a scientific exhibition. The truth is that there is a clear need of a large building in London for exhibition purposes. We have no Palais de l'Industrie as yet, and hence we are obliged to hold our industrial exhibitions in such places as the Agricultural Hall, which has by no means a central site, or the narrow galleries surrounding the Horticultural Society's Gardens, where the apparatus of the Smoke Abatement Exhibition is now very inconveniently crowded. We require for London a commodious and elegant glass and iron structure, of a permanent kind, situated somewhere in the West End, either in Hyde Park or the Green Park, where it would be readily accessible to all. Until we have such a building, our exhibitions, in this age of exhibitions, will never show to good advantage.

Taking the Crystal Palace Electrical Exhibition for what it is, and not for what it might have been, we shall still find plenty to interest us there. The four great divisions of applied electricity, telegraphy, telephony, electric lighting, and the transmission of motive power by electricity, will be represented, and in telegraphy and electric lighting very worthily represented on the whole. Great Britain has played a leading part in the development of the telegraph, and the fruits of her enterprise and ingenuity are visible on the Post Office stall, and the exhibits of the great submarine cable companies. The Wheatstone automatic instrument, which is the most rapid telegraph for overland lines, is shown at work by the Post Office, and the Eastern Telegraph Company exhibit Sir William Thomson's beautiful Siphon Recorder, which is the finest apparatus yet invented for receiving messages through deep-sea cables. The stalls we have mentioned, together with that of the War Office, are situated in the

great nave of the Palace; and the galleries at the west end are also set apart for various exhibits. Fully one-half of these are in their places, and a number of interesting objects are on view. We shall have occasion to refer to some of these stalls at greater length in subsequent articles, but at present they are incomplete.

The display of electric lamps promises to be very good, partly owing to the magnificent vista offered by the grand aisle of the Palace, and the varied objects below, such as ferns, flowers, statuary, and gaily-coloured wares. Visitors will have a rare opportunity of seeing how brightly the various tints appear in the electric light, more especially the green of foliage, owing to the prevalence of actinic rays in the electric arc. It is for this reason that landscape paintings appear doubly natural when lighted by the rays of a "lampe soleil" or Werderman lamp; and on the other hand that flesh tints are apt to seem too purplish. The purely incandescent light such as that of Swan or Edison has a yellowish tinge, which produces a scenic effect more resembling the deadening of gas light, and it is therefore not so well adapted to light a picture-gallery, or the tableau of the stage, as the electric arc or Drummond limelight.

The entire nave will be lighted in sections by arc lights, of different kinds, such as the Siemens', Brush, Jablochkoff, Pilsen, Gravier, and Crompton lamps. The incandescent lights of Swan, Lane-Fox, and Edison will be shown in the courts and enclosures within the Palace; for example, the Alhambra Court, which will be lighted by a crystal chandelier of Lane-Fox lamps hung over the fountain, and the Entertainment Court, which is now being fitted up with a splendid chandelier of a hundred Edison lamps of sixteen candle-power. This brilliant fount of light resembles an enormous basket of flowers, tulips and convolvuli, each arching over towards the observer and displaying between the coloured petals a luminous globe as if it were an enlarged pistil. The stems of the flowers are of gilt brass, the petals are of pearl and opalescent glass; while the pistil is of course the pear-shaped bulb of the incandescent lamp. The Concert Room has been lighted every evening for some time past by Edison lamps swung in festoons from the pillars, or suspended in stars under the galleries, and clustered in two chandeliers hung from the roof. One of these is a small copy of the larger flower basket in the Entertainment Court, and the other is a sac of crystal lustres gleaming here and there with lamps. Altogether the designs of these fittings reflect great credit on Messrs. Verity and Co. of Covent Garden.

#### EDWARD WILLIAM BINNEY, F.R.S., F.G.S.

THIS eminent geologist was born in 1812 at Morton, in Nottinghamshire. He was descended from a long-lived and robust stock of men, very few generations taking the family back long before the times of the Great Rebellion. One of the American branch, the Hon. Horace Binney, with an interest in strange contrast with the indifference commonly felt about such matters in this country, has taken much pains in tracing the origin of his ancestry. Perhaps it will satisfy most persons to know that the father, Thomas Binney, born in the year 1762, was a much respected gentleman, diligent in business, and of the strictest integrity. He was a maltster, often travelling to Manchester, where one of his principal customers was the grandfather of the writer of this article. He died in 1836. Young Binney received his education in a grammar school, conducted on principles of severe discipline, so different from the modern régime. He then served his apprenticeship to a solicitor in Chesterfield. Other pursuits soon occupied his attention, but his legal knowledge was afterwards of the greatest service to him in the commercial portion of his career.

From an early age he was a keen observer of the

operations of nature, and took great interest in philosophical pursuits generally; hence soon after settling in Manchester he sought admission into the Literary and Philosophical Society; his election, on January 25, 1842, taking place by a singular chance on the same day with Dr. Joule's and Dr. Schunck's, subsequently sharers with him in the honours of the presidency. In this Society, so congenial to his tastes, he was a leading spirit. It was mainly owing to his energy that the Society was maintained in its position as a publishing institution, and to it many of his more important papers were addressed.

One of the earliest of these was in 1843, when he read a paper entitled "An Account of the Petroleum found in Downholland Moss," showing that petroleum could be produced from the decomposition, or rather distillation of peat at a low temperature. Little was before known of the origin or utility of this product. In the inquiry he was associated with Mr. W. H. Talbot, who assisted him in making the bores and obtaining information respecting the moss. The following is extracted from Mr. Binney's statement to the Philosophical Society (*Proceedings of the Society*, vol. viii. p. 136). "On the 26th November, 1848, I went to Downholland and showed the deposit to Mr. James Young, and explained to him how the petroleum was there formed. This was before I accompanied that gentleman to Riddings, at Easter, 1849, and went down Mr. Oakes's pit, where the deep coal was wrought, and petroleum flowed from the roof. At both those places the supply of petroleum was not sufficient for commercial purposes on an extensive scale. The Bathgate works were the cause of the petroleum trade in America. In Scotland paraffin oil was first made on a large scale and introduced as an article of commerce. In the suit of Young v. White and others, tried at Westminster in 1854, the circumstances under which Mr. Young first became acquainted with the petroleum at Riddings were given to the public. Of course when the Americans saw the report of that trial they ceased to import high-priced Boghead coal from Scotland, upon which they had to pay a patent right for the manufacture of paraffin oil, and immediately resorted to petroleum, which had been running to waste for ages."

The name "paraffin," adopted by Mr. Binney, was a principal means by which the patent was established.

The successful commercial enterprise thus commenced did not alienate Mr. Binney from the pursuit of science. Besides his paper "On the Origin of Coal," December 1, 1846, he made elaborate investigations on Permian and Triassic Strata; on building stones, of which he made the collection in the geological museum which he was mainly concerned in establishing, and filling with specimens of his own collecting; the drift deposits of Manchester and its neighbourhood," &c., &c. From the last-named paper I extract a paragraph indicating his love of the subject:—"The examination of the older fossiliferous rocks, rich with the remains of organic life, has generally attracted the attention of geologists, to the exclusion of the drift, which has been but too often considered as a dry and uninteresting study. My intention is to attempt to dispel this delusion. However delightful it may be to the human mind to examine the 'medals of creation,' as Cuvier aptly denominated fossil organic remains, and to trace back through countless ages the successive races of beings that have formerly peopled this globe—performed the parts for which they were designed, and then ceased to exist; to investigate the various forms of vegetable life that deprived the atmosphere of its surplus carbon, for the double purpose of forming our invaluable beds of coal, and at the same time fitting the air for the respiration of animals of a higher order; and to examine the wonderful chemical agencies that have been in operation in the great laboratory of nature, in order to prepare our metallic and mineral treasures; still, the last great physical causes which have operated on the face of the globe, and adapted

it for the habitation of man, deserve our attention in an equal, if not more pre-eminent degree.

"It is to this last and finishing stroke of the Creator that the earth chiefly owes its present arrangement of land and water, its beautiful variety of hill and dale, and its different kinds of soils for the support and nourishment of the vegetable kingdom—that wondrous agent for the conversion of brute into organic matter, which fits it for food for the use of the animal creation, and man himself." (*Manchester Memoirs*, vol. viii. N. Ser. p. 196).

Mr. Binney had great sympathy with all earnest intellectual labourers, particularly with those of straitened means, and it did not matter much with him in what field their energies were displayed. Thus among those he helped with his counsel and assistance, Sturgeon, to whom we owe so many first steps in theoretical and practical electricity, is a striking example. It was through Mr. Binney's exertions that this singularly gifted man was rescued from poverty and received Government recognition of his discoveries. Then there were Butterworth the geometrician, Bamford the poet, Richard Buxton the botanist, and many others, whom he cared for with almost a paternal solicitude.

Sixteen years ago he purchased Ravenscliff, in the Isle of Man, and there he spent a large portion of his time, showing much hospitality to men of kindred tastes to his own. There he took pleasure in botany and such geological investigation as the island afforded. He desired nothing more ardently than that nature should flourish around him, and his place was fragrant with myrtles, escalloniae, and roses. He took much interest in a *Eucalyptus globulus*, which, planted close to the sea, grew to the height of twenty feet in a few years.

I do not recollect any one whose heart seemed as it were to go out to all living things with the warmth of affection shown by him. I cannot in this regard help recalling a circumstance which occurred in a walk with him on Langness. A bird's nest containing two eggs being found on the ground, he flung himself down beside it and contemplated it with the greatest delight, but without touching or disturbing it in the least.

He was an enemy to all the so-called "sports" in which cruelty to animals and gambling are the principal features, such as pigeon-shooting, horse-racing, &c. To one who asked him to subscribe 5*l.* for the establishment of a race-course his characteristic reply was: "I will gladly subscribe 5*l.* to prevent it." He even possessed a kind of sympathy, known only to poetic minds, for vegetable life, fully concurring with a remark I made to him, that a man who could take pleasure in felling a noble tree must be destitute of the finer feelings of humanity.

Mr. Binney had a large, muscular frame, and his countenance in profile resembled that of Cato the censor, with whose character he had many points of strong resemblance.

Long time a sufferer in health without fatiguing his friends with complaints, "the silver cord was loosed" on December 8. The paralysis terminated fatally on the 19th, and on the 23rd he was buried in the family grave at Worksop.

He has left a widow, daughter of the Rev. David Jones, Rector of Hope Bagot, near Ludlow, and six children.

J. P. JOULE

#### THE LATE CHANGES IN THE VESUVIAN CONE

NOVEMBER, 1881.—The condition of the crater of Vesuvius is at present exceedingly interesting. This is especially so after the continuous active state that the mountain has been in for nearly three years. The old crater of 1872 is now completely filled, and has in fact been so for some time. About three-quarters of the edge